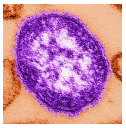
The presentation will begin shortly. There will be no audio until then.

NORTH DAKOTA DEPARTMENT of HEALTH

All You've Ever (or Never) Wanted to Know About Measles… and more!

Measles FAQ



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How to Use Today's Presentation

- First, a question commonly asked of the Immunization Program will be presented.
- Next, answer choices will be shown.
- A poll will appear on the right side of your screen
  - Discuss the question amongst your group and choose an answer.
  - All participants will have 1 minute to answer.
- The correct answer and the results will be shown after 1 minute.
  - Percentages will be shown, not individual responses.

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The prodromal phase of measles is characterized by malaise, fever, loss of appetite and the "three C's." What are the "three C's" of measles?

QUESTION 1

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Question1

What are the "three C's" of measles?

A. Canker Sores, Cough, Coldness
B. Coldness, Cough, Clamminess
C. Cough, Coryza, Conjunctivitis
D. Conjunctivitis, Coryza, Cysts

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Answer 1

What are the "three C's" of measles?

A. Canker Sores, Cough, Coldness
B. Coldness, Cough, Clamminess
C. Cough, Coryza, Conjunctivitis
D. Conjunctivitis, Coryza, Cysts

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Symptoms of Measles

- Characterized by a prodrome of fever, malaise, cough, coryza and conjunctivitis.
  - Prodrome usually lasts between three and five days.
- The prodrome is followed by a maculopapular rash.
  - Usually appears 14 days after exposure
  - Spreads from head to trunk to lower extremities

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Measles may be clinically indistinguishable from another vaccine preventable disease. **For this reason, when ordering measles testing, _____ testing should also be ordered.**

QUESTION 2

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Question 2: Fill in the Blank

For this reason, when ordering measles testing, _____ testing should also be ordered.

A. Chickenpox
B. Rubella
C. Diphtheria
D. Rotavirus

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Answer 2

For this reason, when ordering measles testing, _____ testing should also be ordered.

A. Chickenpox

B. Rubella

C. Diphtheria

D. Rotavirus

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Ordering Multiple Tests

- Difficult to differentiate between rash illnesses.
  - Rubella is often misdiagnosed as scarlet fever or measles and vice versa.
- Important to order multiple tests.
  - Should always order rubella testing when suspecting measles and vice versa.
- Measles has been misdiagnosed as Kawasaki disease, dengue fever and scarlet fever among other diseases.
  - Several cases in Ohio initially were misdiagnosed as Dengue fever.

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Measles Virus Laboratory Confirmation

- Acute measles infection can be confirmed by:
  - Positive serologic test for serum measles IgM antibody
  - Significant rise in measles IgG antibody between acute and convalescent titers
  - Isolation of measles virus
  - Detection of measles viral RNA by reverse transcription polymerase chain reaction (PCR)

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Laboratory Specimens Needed

- Specimens needed for measles Testing:
  - Throat or nasopharyngeal swab for PCR
    - Throat swab preferred.
  - Urine specimen for PCR
  - Blood for measles **IgM** and IgG
- Specimens needed for rubella testing
  - Throat or nasopharyngeal swab
  - Blood for rubella **IgM** and IgG

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A case of measles is infectious during which period of time?

QUESTION 3

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Question 3:Pick the Best Choice

A case of measles is infectious during which period of time?

A. 5 days after the rash appears
B. 2 days before the rash appears to 4 days after
C. 4 days before the rash appears to 4 days after
D. 14 days after symptoms begin

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Answer 3

A case of measles is infectious during which period of time?

A. 5 days after the rash appears
B. 2 days before the rash appears to 4 days after
C. 4 days before the rash appears to 4 days after
D. 14 days after symptoms begin

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Infectiousness of Measles

- Measles is extremely contagious.
  - Contagious 4 days before rash appears to 4 days after
- Must do contact investigation
  - Check contacts' MMR vaccination status or evidence of immunity
    - If susceptible, contacts will need to receive post exposure prophylaxis or be excluded from public activities.
      - MMR vaccine can prevent infection in exposed persons if given within 72 hours of exposure.
        - » In some cases Immunoglobulin may be indicated.
  - If case attends group setting, unvaccinated individuals may need to be excluded until 21 days after the onset of rash in the last case of measles.

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Isolation

- Individuals with confirmed or suspected measles should be isolated during the infectious period.
- Hospitalized individuals should be put in a negative pressure room during infectious period.
  - If negative pressure room is unavailable, air handling system may need to be examined to identify potential exposures.
- N95 mask should be worn while in contact with case.

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Measles Isolation Guidance

- If measles is suspected in a clinic, ER or hospital setting, **isolate immediately.**
  - Do not allow patient to sit in waiting room
- Airborne isolation room or private room with the door closed
- Mask patient if feasible
- Ensure health care personnel have evidence of immunity
  - Only health care workers with 2 documented doses of MMR or laboratory evidence of immunity should care for patient.
- Visitors should be limited to those with evidence of measles immunity
- In hospital setting, respiratory precautions including N95 masks or PAPR, even for those with evidence of immunity

ACIP and CDC guidance available at
http://www.cdc.gov/mmwr/pdf/rr/rr6007.pdf and
http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf

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If there is a case of measles in a school, unvaccinated children will be excluded for how long?

QUESTION 4

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Question 4: Pick the Best Choice

If there is a case of measles in a school, unvaccinated children will be excluded for how long?

A. For a month as punishment
B. 5 days after exposure until 21 days after the last case of measles–this is the incubation period for measles
C. Two weeks, after that, we know they won't develop measles
D. The rest of the school year, unvaccinated children are not allowed to attend school in North Dakota

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Answer 4

If there is a case of measles in a school, unvaccinated children will be excluded for how long?

A. For a month as punishment
B. 5 days after exposure until 21 days after the last case of measles–this is the incubation period for measles
C. Two weeks, after that, we know they won't develop measles
D. The rest of the school year, unvaccinated children are not allowed to attend school in North Dakota

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School Exclusion

- Students may claim exemptions to vaccination requirements.
  - Philosophical
  - Moral
  - Religious
  - Medical (requires health professional signature)
- In the event that there is a case of measles in a school
  - Students who do not meet the vaccination requirements will be excluded for 21 days after the last case of measles.
    - Based on the incubation period of seven to 21 days
    - Student will be excluded beginning on the fifth day after exposure.

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What are the MMR vaccination recommendations for adults who are *not* high risk?

QUESTION 5

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Question 5: Pick the Best Choice

What are the MMR vaccination recommendations for adults who are *not* high risk?

A. All adults are recommended to have two doses of MMR vaccine or evidence of immunity.
B. All adults born in or after 1957 are recommended to have two doses of MMR vaccine or evidence of immunity.
C. All adults born in or after 1957 are recommended to have one dose of MMR vaccine or evidence of immunity.
D. Adults are not recommended to receive MMR vaccine.

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Answer 5

What are the MMR vaccination recommendations for adults who are *not* high risk?

A. All adults are recommended to have two doses of MMR vaccine or evidence of immunity.
B. All adults born in or after 1957 are recommended to have two doses of MMR vaccine or evidence of immunity.
C. All adults born in or after 1957 are recommended to have one dose of MMR vaccine or evidence of immunity.
D. Adults are not recommended to receive MMR vaccine.

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MMR Recommendations for Adults

- Adults born before 1957 are presumed to be immune to measles and are therefore not recommended to receive MMR vaccine.
- All adults born in 1957 or later should have at least one documented dose of MMR vaccine or laboratory evidence of immunity.

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What are the routine recommendations for MMR vaccination in children?

QUESTION 6

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Question 6: Pick the Best Choice

What are the routine recommendations for MMR vaccination in children?

A. Children should receive one dose at 12-15 months and a second dose at 4-6 years.
B. Children should receive one dose at 16 months and another dose at 24 months.
C. Children are not recommended to receive MMR vaccine.
D. Children should receive a dose of MMR at age 17 before attending college.

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Answer 6

What are the routine recommendations for MMR vaccination in children?

A. Children should receive one dose at 12-15 months and a second dose at 4-6 years.
B. Children should receive one dose at 16 months and another dose at 24 months.
C. Children are not recommended to receive MMR vaccine.
D. Children should receive a dose of MMR at age 17 before attending college.

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MMR Routine Recommendations

- MMR (measles, mumps and rubella) vaccine is routinely recommended for children.
  - First dose should be given at 12 to 15 months.
  - Second dose should be given at four to six years.

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What are the MMR vaccination recommendations for high risk adults?

QUESTION 7

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Question 7: Pick the Best Choice

What are the MMR vaccination recommendations for high risk adults?

A. All high risk adults should have evidence of immunity or two documented doses of MMR vaccine.
B. All high risk adults should have evidence of immunity or one documented dose of MMR vaccine.
C. All adults are immune to measles.
D. High risk adults should have a total of 3 documented doses of MMR vaccine.

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Answer 7

What are the MMR vaccination recommendations for high risk adults?

A. **All high risk adults should have evidence of immunity or two documented doses of MMR vaccine.**
B. All high risk adults should have evidence of immunity or one documented dose of MMR vaccine.
C. All adults are immune to measles.
D. High risk adults should have a total of 3 documented doses of MMR vaccine.

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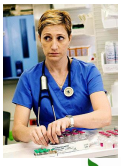
High Risk Recommendations

- Adults who are considered high risk are recommended to have two documented doses of MMR vaccine or laboratory evidence of immunity.
- High Risk groups include:
  - Health Care Workers
  - College Students
  - International Travelers



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Health Care Worker Vaccination Recommendations

- Health Care Personnel (HCP) who work in medical facilities should be immune to measles.
  - Although birth before 1957 generally is considered acceptable evidence of measles immunity, health care facilities should consider recommending 2 doses of MMR vaccine routinely to HCP born before 1957 who do not have laboratory evidence of disease or immunity to measles.
  - HCP born in 1957 or later can be considered immune to measles only if they have documentation of
    - Laboratory confirmation of disease or immunity
    - Appropriate vaccination against measles (2 doses of live measles vaccine given on or after the first birthday and separated by 28 days or more.)
      - HCP with 2 documented doses are not recommended to be serologically tested for immunity.

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What are the vaccination recommendations for high risk infants age 6 to 11 months?

QUESTION 8

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Question 8: Pick the Best Choice

What are the vaccination recommendations for high risk infants age 6 to 11 months?

A. Infants traveling internationally should receive a dose of MMR vaccine before travel.
B. Infants traveling internationally or to California should receive a dose of MMR vaccine before travel.
C. Infants traveling internationally should be masked at all times.
D. Infants traveling internationally should receive 2 doses of MMR before travel.

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Answer 8

What are the vaccination recommendations for high risk infants age 6 to 11 months?

A. Infants traveling internationally should receive a dose of MMR vaccine before travel.
B. Infants traveling internationally or to California should receive a dose of MMR vaccine before travel.
C. Infants traveling internationally should be masked at all times.
D. Infants traveling internationally should receive 2 doses of MMR before travel.

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High Risk Infants

- Infants between six and 12 months who are traveling internationally are recommended to receive one dose of MMR prior to travel.
  - Because the dose is given before one year of age, it would be considered invalid.
  - The child would still need to receive the routinely recommended doses at 12 to 15 months and four to six years(total of three doses.)

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Recommendations During Outbreak

- CDC has not changed standard MMR vaccination recommendations in response to the current outbreak.
  - Travel recommendations only include international travel.
    - Not recommended to vaccinate individuals born before 1957
    - Early vaccination of infants is not recommended for domestic travel.
    - Adults (born in 1957 or after) who are not high risk are recommended to have one dose of MMR vaccine or evidence of immunity.
- Vaccination is at the discretion of the physician.
- If a local outbreak occurs, state health departments have authority to provide revised vaccine recommendations.

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About how effective is the MMR vaccine?

QUESTION 9

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Question 9: Pick the Best Choice

About how effective is the MMR vaccine?

A. The MMR vaccine is 30% effective with one dose and 75% effective with two doses.
B. The MMR vaccine is 93% effective with one dose and 97% effective with two doses.
C. The MMR vaccine is not effective at all.
D. The MMR vaccine is always 100% effective.

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Answer 9

About how effective is the MMR vaccine?

A. The MMR vaccine is 30% effective with one dose and 75% effective with two doses.
B. The MMR vaccine is 93% effective with one dose and 97% effective with two doses.
C. The MMR vaccine is not effective at all.
D. The MMR vaccine is always 100% effective.

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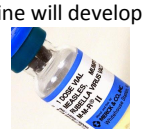
MMR Vaccine

- The MMR vaccine is very effective.
  - About 93 percent of people who receive one dose of vaccine will develop immunity to measles.
  - About 97 percent of people who receive two doses of vaccine will develop immunity to measles.



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When was measles first documented in the United States?

QUESTION 10

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Question 10: Pick the Best Choice

When was measles first documented in the United States?

A. 1957
B. 1657
C. 2000
D. 1700

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Answer 10

When was measles first documented in the United States?

A. 1957
B. 1657
C. 2000
D. 1700

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Measles in History

- **900 C.E.:** A Persian physician is the first person to document the existence of measles when he wrote about trying to distinguish measles from smallpox.
- **1657:** Measles is first documented in the United States when a Boston merchant named John Hull wrote in his diary that " the disease of measles went through the town," but fortunately there were few deaths.
- **1861:** Measles also played a large part in the civil war.
  - *During the first year of war there were 21,676 reported cases of measles and 551 deaths in the Union Army alone. Deaths were primarily from respiratory and cerebral (brain) involvement.*
- **1878:** The Yuma tribes along the Gila River in southern Arizona noted that measles killed many children from 1878-1879.
- **1954:** The measles virus is isolated and would eventually be used to create a series of vaccines.

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When was the measles vaccine first licensed in the United States?

QUESTION 11

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Question 11: Pick the Best Choice

When was the measles vaccine first licensed in the United States?

A. The first measles vaccine was licensed in 1917.
B. The first measles vaccine was licensed in 1963.
C. Scientists are still working on creating an effective vaccine for measles, which is why there are outbreaks of measles in the U.S.
D. The first measles vaccine was licensed in 1975.

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Answer 11

When was the measles vaccine first licensed in the United States?

A. The first measles vaccine was licensed in 1917.

B. The first measles vaccine was licensed in 1963.

C. Scientists are still working on creating an effective vaccine for measles, which is why there are outbreaks of measles in the U.S.

D. The first measles vaccine was licensed in 1975.

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Measles Vaccine History

- The first measles vaccine was licensed in 1963.
  - Killed vaccine was also available in 1963. This vaccine was taken off the market in 1967.
- The combination vaccine MMR was licensed in 1971.
  - Protects against measles, mumps and rubella
- The two dose schedule was introduced in 1989.

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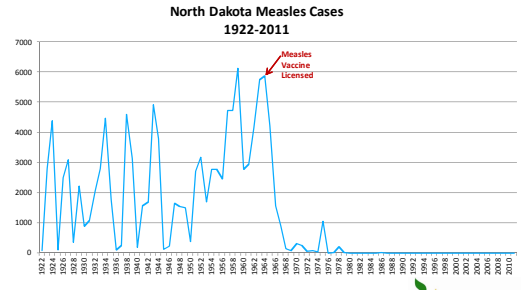
Measles in North Dakota



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Epidemiology of Cases before Vaccine

- Approximately 500,000 cases were *reported* annually in the United States.
  - The actual number of cases was estimated to be between 3-4 million annually.
- Approximately 48,000 people were hospitalized due to measles each year.
- Approximately 4,000 people suffered encephalitis.
- Approximately 400 to 500 people died each year.

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What is the maximum age a person should receive the MMR vaccine?

QUESTION 12

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Question 12: Pick the Best Choice

What is the maximum age a person should receive the MMR vaccine?

A. There is no maximum age indication for MMR vaccine.
B. The maximum age indication for MMR vaccine is 18.
C. The maximum age indication for MMR vaccine is 65.
D. The maximum age indication for MMR vaccine is 7.

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Answer 12

What is the maximum age a person should receive the MMR vaccine?

A. There is no maximum age indication for MMR vaccine.

B. The maximum age indication for MMR vaccine is 18.

C. The maximum age indication for MMR vaccine is 65.

D. The maximum age indication for MMR vaccine is 7.

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MMR Vaccine

- There is no maximum age indication for MMR vaccine.
- Individuals who are recommended to receive vaccine and cannot provide evidence of immunity or vaccination should receive a dose.
  - *No* increased risk of vaccination if the individual already received a dose or had the disease.
- Second dose of vaccine must be at least 28 days after the first dose.
  - Minimum interval between live vaccines

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How many cases of measles have been reported in North Dakota this year?

QUESTION 13

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Question 13: Pick the Best Choice

How many cases of measles have been reported in North Dakota this year?

A. One
B. Zero
C. Fourteen
D. Seven

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Answer 13

How many cases of measles have been reported in North Dakota this year?

A. One
B. Zero Cases of Measles in North Dakota!
C. Fourteen
D. Seven

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Measles in North Dakota

- The last case of measles in North Dakota was in 2011.
  - Our first case of measles in over 23 years.
- Was exposed to measles while traveling on an airplane
- Spent his infectious period in South Dakota
- His sister later developed measles from their time together in South Dakota.
- No other known cases associated

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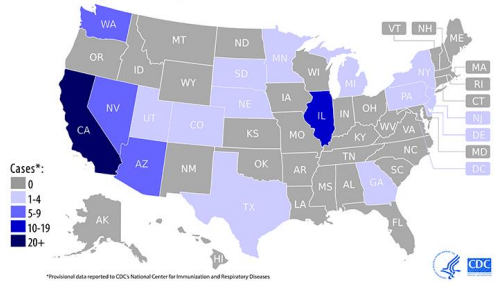
2015 Measles Cases in the U.S.

January 1 to March 6, 2015



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Recent Cases in Border States

- South Dakota
  - Mitchell Outbreak
    - First case reported on December 30th, 2014
    - 13 confirmed cases
    - Cases were an extended family group
    - All cases were unvaccinated
  - Sioux Falls Case
    - Reported on January 24th, 2015
    - Not known to be connected to Mitchell outbreak
- Minnesota
  - One case confirmed in a university student on January 30th, 2015
  - Student was unvaccinated and recently returned from international travel

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At what point should a case of measles be reported?

QUESTION 14

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Question 14: Pick the Best Choice

At what point should a case of measles be reported?

A. A case of measles should only be reported after it is laboratory confirmed.

B. A case of measles should be reported as soon as it is suspected.

C. A case of measles should be reported after the individual is no longer contagious.

D. Measles is not a reportable condition.

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Answer 14

At what point should a case of measles be reported?

A. A case of measles should only be reported after it is laboratory confirmed.

B. A case of measles should be reported as soon as it is suspected.

C. A case of measles should be reported after the individual is no longer contagious.

D. Measles is not a reportable condition.

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Reporting Laws

- **If measles is suspected, do not wait for laboratory results to report suspected cases.**
  - Timely reporting of suspected cases will allow the NDDoH to investigate cases and contacts and make recommendations to reduce transmission in the community.
  - **Call 1.800.472.2180 or 701.328.2378**
- Measles is a mandatory reportable condition according to North Dakota Administrative code 33-06-01 and Statutory Authority NDCC 23-07-01.

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Type your question in the chat window to the right

After the presentation, questions may be sent to:

Molly Howell	**mahowell@nd.gov**
Abbi Berg	**alberg@nd.gov**
Amy Schwartz	**amschwartz@nd.gov**
Miranda Baumgartner	**mlbaumgartner@nd.gov**
Sherrie Meixner	**smeixner@nd.gov**
Mary Woinarowicz	**mary.woinarowicz@nd.gov**
Dominick Fitzsimmons	**dfitzsimmons@nd.gov**

Immunization Program :
701.328.3386 or toll-free 800.472.2180

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Post-test

- Post-test
  - Nurses interested in continuing education credit, visit:
    www.ndhealth.gov/disease/post/default.aspx?PostID=75
  - Successfully complete the five-question post-test to receive your certificate.
- Credit for this session available until Tuesday, April 7th, 2015.
- This presentation will be posted to our website: www.ndhealth.gov/immunize.

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